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(51) INT CL^6
E06B 3/88

(52) UK CL (Edition O)
E1J JGR

(56) Documents Cited
GB 2218449 A **GB 2212845 A** **WO 90/12945 A1**
DE 003704242 A **DE 003219492 A** **FR 002572124 A**
FR 002565622 A **US 4040142 A**

(58) Field of Search
UK CL (Edition N) **E1J JGR**
INT CL^6 **E06B 3/88**
Online: World Patents Index, EDOC.

(54) Hinged door finger guard

(57) A finger guard comprises a cover 4 for the gap at the hinge side of a door 1 and door frame 3 combination. The cover 4 is a strip of a rigid material which is flexible about its minor axis, the strip having attachment means at its long edges, preferably adhesive, whereby each edge may be secured respectively to the door 1 and door frame 3. The strip may include at least one longitudinally-directed hinge 8 and the attachment means may allow some vertical movement for a door with rising-butt type of hinges by providing a T-shaped member 14 secured in the channel of housing 16. The cover 4 is preferably of plastic or fibrous or fluted board.

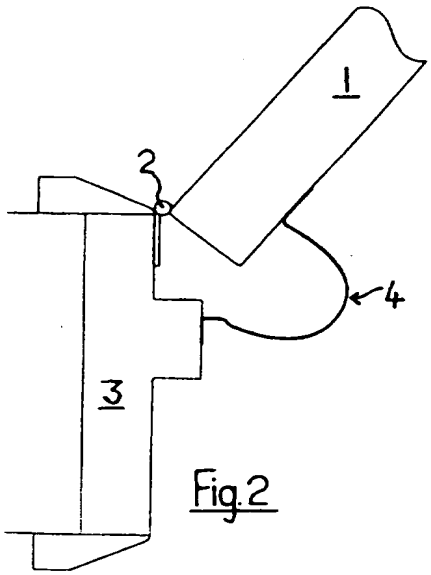

Fig.2

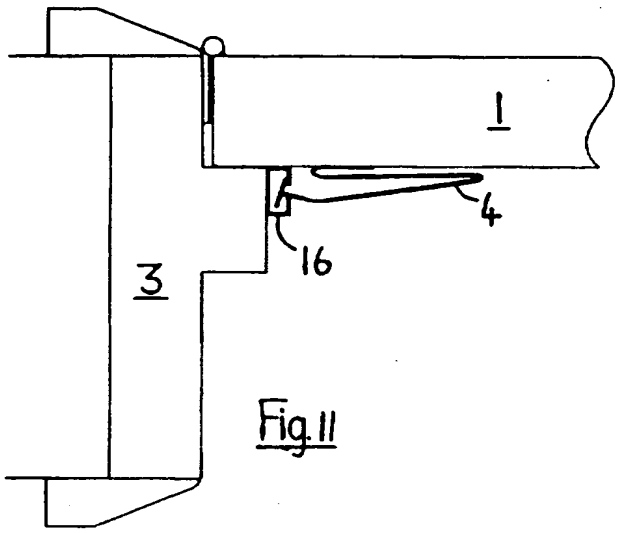

Fig.11

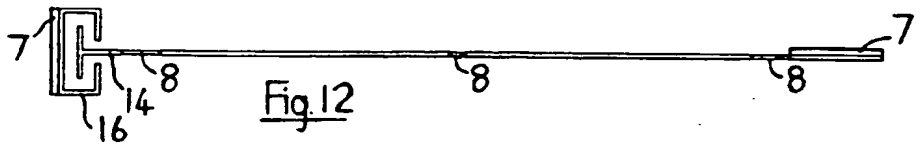

Fig.12

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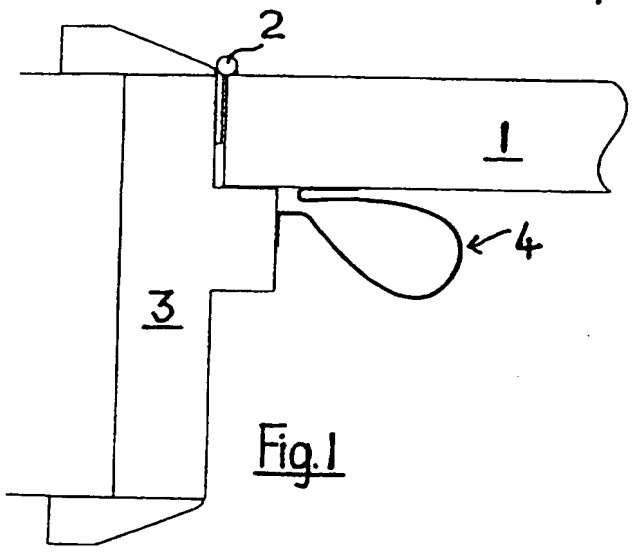

Fig.1

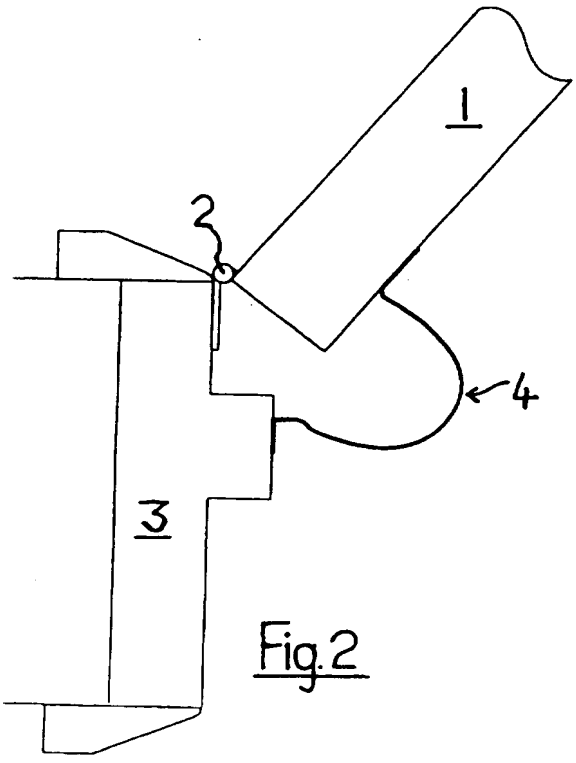

Fig.2

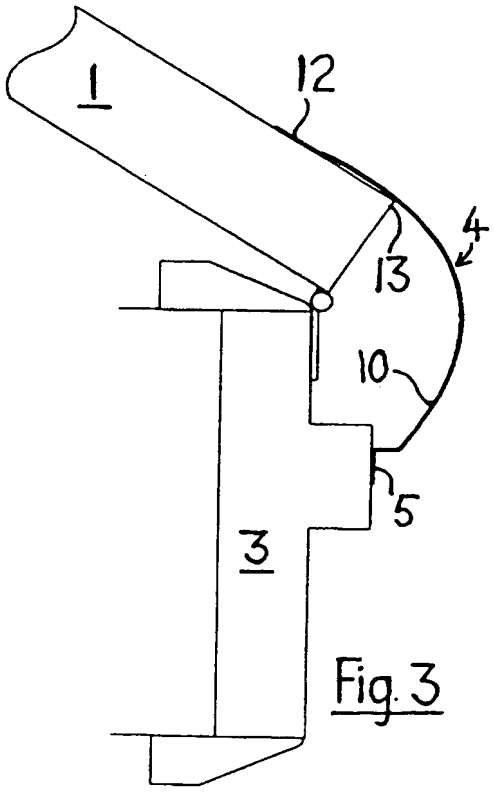

Fig.3

Fig.4

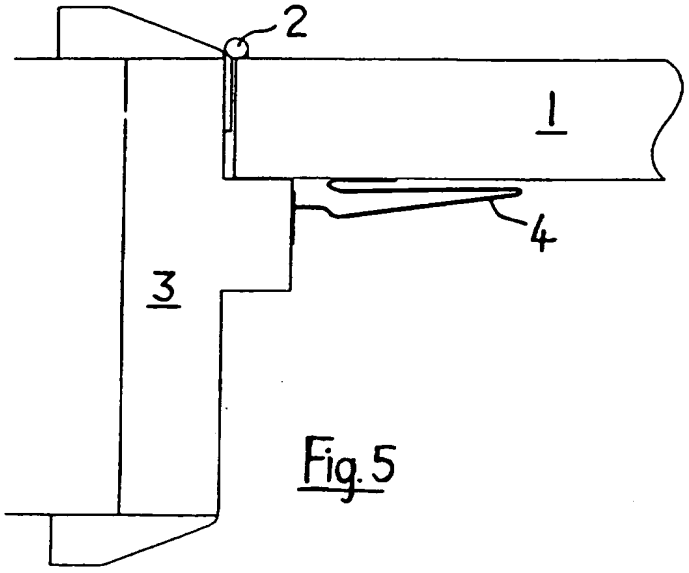

Fig. 5

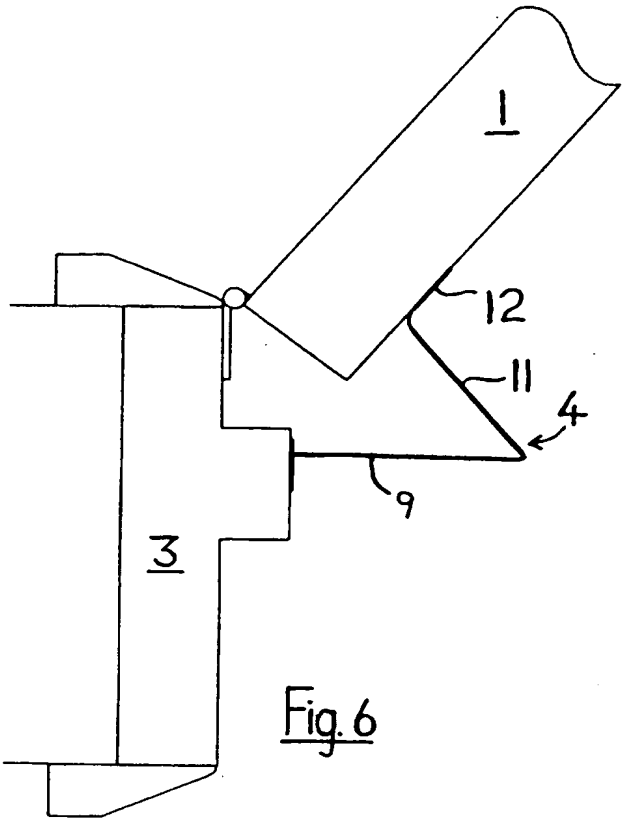

Fig. 6

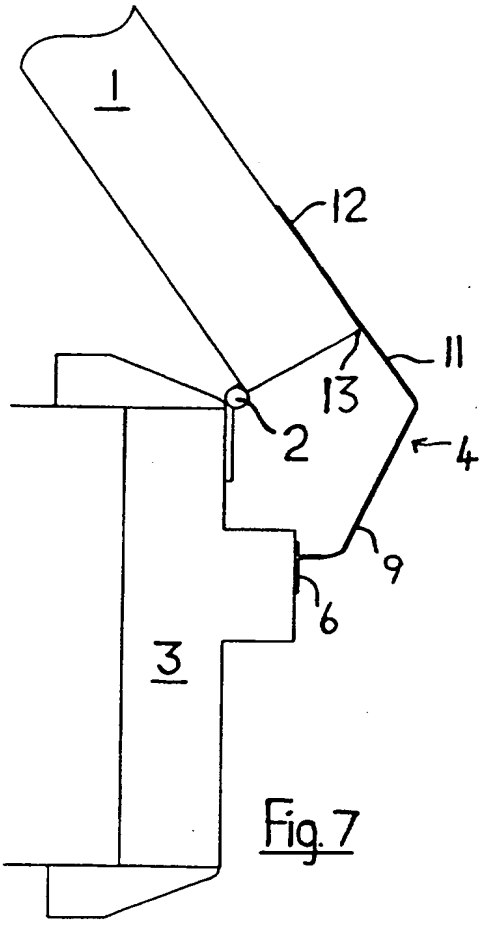

Fig. 7

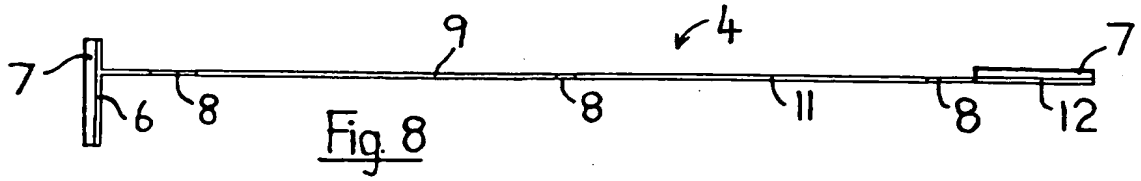

Fig. 8

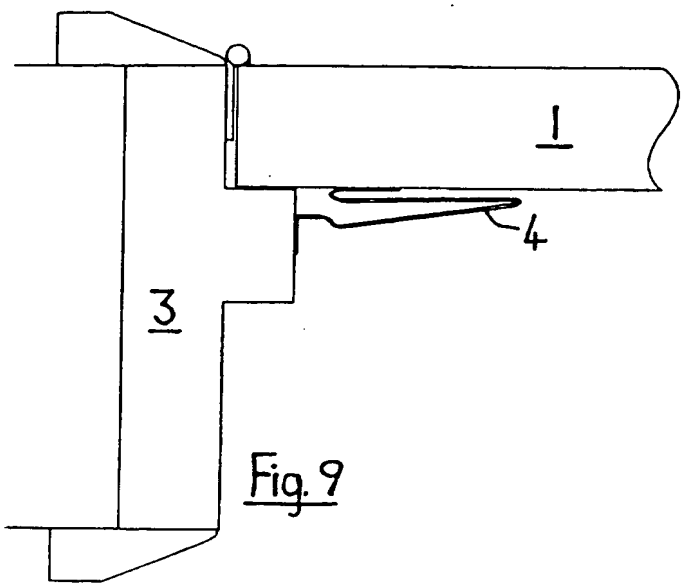

Fig. 9

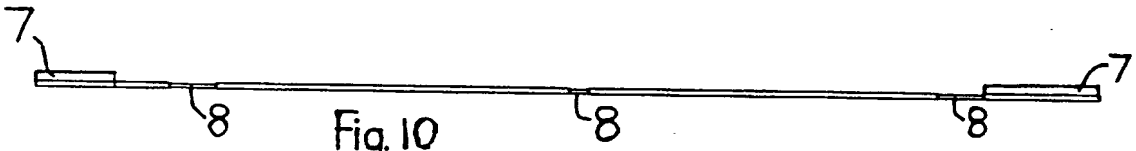

Fig. 10

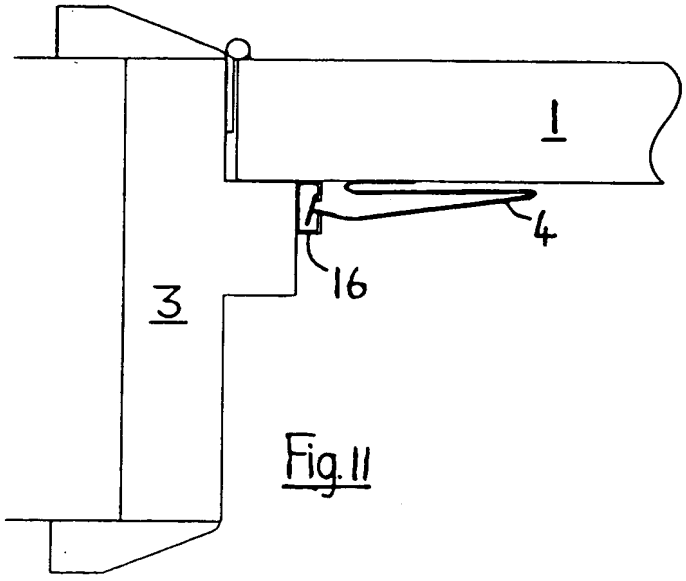

Fig. 11

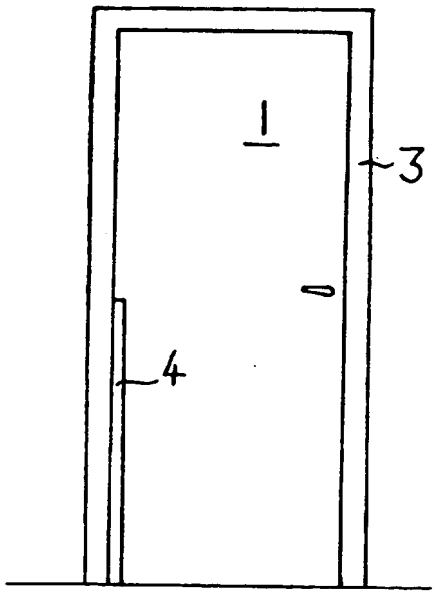

Fig. 13

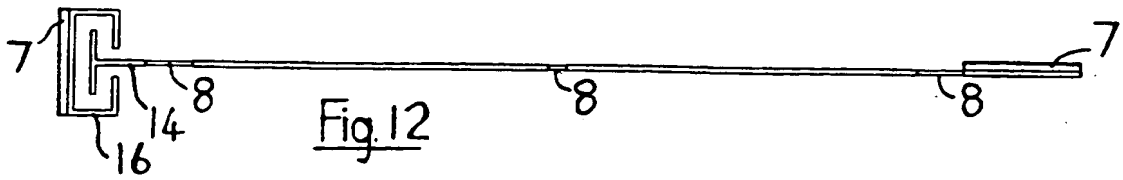

Fig. 12

DOOR SAFETY DEVICE

This invention relates to a door safety device. It relates particularly to a device for fitting at the hinge side of a door and door frame in order to reduce the risk of injury to a child's fingers if they should attempt to enter this space.

When a door is in the open position, the hinge side of the opening between the door side and the door frame offers a gap into which a young child's hand or fingers can very easily be inserted. If the door should then be closed, possibly by another child or by the pressure from a draught of wind, there is a serious risk that the hand or fingers will become hurt or badly damaged. In time, of course, any child will learn that the gap at the edge of a door that is being closed is a dangerous area in the home and any fingers should be kept well away from this zone. However, the younger child will not be aware of this risk and may suffer a crushed finger.

The present invention was devised to provide a shield that would reduce the risk of injury to a child's hand.

According to the invention, there is provided a cover for the gap at the hinge side of a door and door frame combination, the cover comprising a strip of a rigid material which is flexible about its minor axis, the strip having attachment means at its long edges whereby each edge may be secured respectively to the door and door frame of the combination. The strip may be constructed such that the long edges are

comparatively rigid in behaviour whilst the strip area between said long edges remains comparatively flexible.

Conveniently, the strip may be arranged so that the long edges are made of a material of greater thickness than the material between said long edges. The strip may be made such that the strip area between said long edges is shaped with a predetermined curvature along the strip minor axis. Where the cover is formed of a plastics material, the strip curvature may be effected in a plastics forming process such as extrusion.

In one embodiment, the rigid material of the cover includes at least one longitudinally-directed hinge.

Preferably, the cover includes three hinges which extend the full length of the strip.

At one long edge of the strip, the attachment means may allow some vertical movement of the edge so that the cover will operate correctly with door hinges of the rising-butt type. The vertical movement attachment means may include the strip edge being formed in a T-shape and this edge being positioned in a C-shaped housing which will hold the T-shape yet allow the necessary vertical movement.

In another embodiment, the cover is formed of a plastics material with the hinges being coextruded during a plastics forming operation. Preferably, the material is a PVC composition using a combination of rigid and flexible PVC

material.

In an alternative embodiment, the cover is formed of a fibrous board material made flexible in the hinge areas by a crease being formed in the board.

By way of example, some particular embodiments of the invention will now be described with reference to the accompanying drawings, in which:

Figure 1 is a partial horizontal cross-sectional view through a door and door frame when fitted with the door safety device of the invention,

Figure 2 is a view similar to that of Figure 1 when the door has been opened through an angle of sixty degrees,

Figure 3 is a similar view when the door has been opened fully,

Figure 4 is a cross-sectional view through the safety device,

Figures 5 to 8 are similar views respectively of a different embodiment of safety device,

Figures 9 and 10 are views of a further embodiment of safety device,

Figures 11 and 12 are views of yet a further embodiment, and,

Figure 13 shows on a reduced scale a view of a door and door frame with a fitted safety device.

As shown particularly in Figure 1, the safety device of

the invention is intended to be fitted at the hinge side of a door located in a door frame so that it will cover the large gap that appears when the door is opened. It is not necessary for the device to extend the full length of the vertical door side because a young child cannot be expected to reach very far up the door side. Therefore, a cover which extends a little more than halfway up the door side is likely in practice to be sufficient protection.

Figures 1 to 3 show the door being opened to different angles with respect to the door frame. The door 1 is mounted on hinges 2 that are located on the door frame 3. The safety device 4 is adhesively secured at one side to the door 1 and at the other side to the door frame 3. When the door is in the closed position (Figure 1) the safety device 4 forms a roll-like shape which occupies the corner where the door and frame come together. As the door is opened, the device 4 unfolds into a generally convex shape (Figures 2 and 3) which will tend to cover the gap that appears with the greater angle of opening. A child's fingers will thus be prevented from entering this gap so there will be a reduced risk of accidental damage when the door closes. Upon closure of the door, the safety device 4 becomes folded again so that it will return to the position of Figure 1.

Figure 4 depicts a cross-sectional view of the safety device which in this embodiment was made of a PVC composition

with sections of rigid and flexible material. At the left hand side, the view shows an L-shaped foot 5 which carries an adhesive pad 7 by which the device may be attached to the door frame 3. The foot 5 is joined to a comparatively flexible region 10 which is shaped so as to lie in a convex attitude when the safety device is fitted to the door and frame combination. At an opposite side of the region 10, the region 10 is attached to a plate 12 on which a further adhesive pad 7 is located.

In operation of the safety device, the installation to the door is effected by using the adhesive pads 7. After peeling off a protective strip from each pad, the pads 7 at the ends of the safety device are secured in the positions shown in Figure 1. Upon opening the door 1, the foot 5 and the plate 12 are moved away from one another and the flexible region 10 is caused to bow outwards in a convex shape to provide a shield over the potentially dangerous gap at the door edge. When the door reaches the position depicted in Figure 3, the flexible region 10 is seen to lie in contact with the flat surface of the door 1 so that the door edge 13 effectively forms a fulcrum for supporting the region 10. The door edge 13 thus helps to maintain the convex shape of the safety device 4 and holds it firmly so that the cover will be resistant to being pushed inwardly even if a child's fingers should attempt to distort the cover shape. It will be noted

that the method of installing the safety device on the door in the position shown in Figure 1, does rely on the plate 12 being spaced by a predetermined distance from the door edge 13. As the plate 12 and the edge 13 are always spaced apart from one another this provides a firm support for the flexible region 10 when the door is in the open condition.

Figures 5 to 8 show a different embodiment of safety device which was devised to lie in an unobtrusive manner against the door edge when the door is closed. In this embodiment, the device is formed with rigid portions and intervening hinges of flexible material.

Figure 8 shows a cross-sectional view of the safety device which was made of a PVC composition with sections of rigid and flexible material. At the left hand side, the view depicts a T-shaped foot 6 which carries an adhesive pad 7. The foot 6 is attached by means of a hinge 8 to a rigid portion 9 and then by a further hinge 8 to a second rigid portion 11. The second rigid portion 11 is attached by a hinge 8 to a plate 12 on which a further adhesive pad 7 is located.

In operation of the safety device, the pads 7 are secured in the positions shown in Figure 5 to the door and door frame. The installation is effected with the rigid portions (9,11) folded about their connecting hinge 8. Upon opening the door 1, the rigid portions (9,11) then unfold

from one another and open outwards so that a convex shield is provided over the door edge gap. When the door reaches the position depicted in Figure 7, the second rigid portion 11 is seen to lie on contact with the flat surface of the door 1 so that the door edge 13 again forms a fulcrum for supporting the rigid portion 11. As described on connection with the previous embodiment, the door edge 13 maintains the convex shape of the safety device 4 so that it is unlikely to be distorted by pressure from a child's fingers.

Figures 9 and 10 show a further embodiment which is particularly suitable for being made from a board material such as a rigid cardboard, a fluted board or a board made of a plastics material. The different parts have the same reference numerals as those already described. In Figure 10, the hinges 8 are made by a creasing operation on the board.

Whilst the embodiments already described are suitable for use on doors with conventional door hinges, there is also in common use a different hinge termed a rising-butt hinge which allows a small vertical movement of the door upon opening so that a raised carpet edge can be cleared. The embodiment shown in Figures 9 and 10 is readily adapted for this type of hinge since the board material of the device can be allowed vertical movement by providing a vertical column of diagonally directed slits along the length of the device. There are also other ways of obtaining the vertical movement capability such

as combinations of cutting and creasing and these techniques will be well-known to those familiar with this material.

In order to provide a safety device that was suited to both conventional and rising-butt door hinges, the embodiment shown in Figures 11 and 12 was devised. In this construction, the T-shaped foot 6 is replaced by an anchor 14 which is capable of being secured in a C-shaped housing 16. The housing 16 is provided with its own adhesive pad 7 by which it may be attached to the door frame 3. The housing 16 thus forms a secure fixture for the anchor 14 but it permits the anchor to move up and down along the housing as may be required to compensate for the vertical movement of a door mounted on rising-butt hinges.

Figure 13 shows a door 1 located in a door frame 3 with the safety device 4 of the invention mounted at the hinge side of the door 1. It will be seen that the device 4 does not need to extend up the full height of the door because a young child will not be able to reach much more than halfway up the door. The safety device 4 is designed to fold automatically upon closure of the door so that it can remain unobtrusive in appearance.

The foregoing description of embodiments of the invention has been given by way of example only and a number of modifications may be made without departing from the scope of the invention as defined in the appended claims. For instance,

instead of the safety device ends being secured by adhesive pads, an alternative method such as screw fixings could be used. The plastics material used for the safety device has been described as a combination of rigid and flexible PVC material. This is preferably a translucent PVC or even a PVC that has been given a light blue tint. It is also preferred that the safety device will have an unobtrusive appearance when it is located on the protected door and there are likely to be many other plastics and alternative materials that will fulfil this object.

CLAIMS

1 A door safety device comprising a cover for the gap at the hinge side of a door and door frame combination, the cover comprising a strip of a rigid material which is flexible about its minor axis, the strip having attachment means at its long edges whereby each edge may be secured respectively to the door and door frame of the combination.

2 A door safety device as claimed in Claim 1, in which the strip area between the long edges is shaped with a predetermined curvature along the strip minor axis.

3 A door safety device as claimed in Claim 1, in which the rigid material of the cover includes a longitudinally-directed hinge.

4 A door safety device as claimed in Claim 3, in which the cover is formed with rigid portions and three longitudinally-directed hinges.

5 A door safety device as claimed in any one of Claims 1 to 4, in which the cover is formed of a fibrous or fluted board material.

6 A door safety device as claimed in any one of Claims 1 to 5, in which the attachment means at one side of the strip allows a vertical movement with respect to the other attachment means.

7 A door safety device as claimed in any one of Claims 1 to 6, in which one strip edge is formed in a T-shape, the said

edge being positioned in a C-shaped housing for vertical movement with respect to the other attachment means.

8 A door safety device as claimed in any one of Claims 1 to 7, in which the cover is formed of a plastics material with any hinges being shaped integrally in a plastics moulding construction.

9 A door safety device, substantially as hereinbefore described with reference to any one of the accompanying drawings.

The Patent Office

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Application N : GB 9521468.0 **Examiner:** F J Rowlatt
Claims searched: 1-9 **Date of search:** 24 November 1995

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.N): E1J: JGR.

Int Cl (Ed.6): E06B: 3/88

Other: Online: World Patents Index, EDOC.

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X,Y	GB2218449A	(SWADDLE & STONES) - whole document relevant.	X: 1, 3, 4 & 8. Y: 5
X,Y	GB2212845A	(WILDMAN) - whole document relevant.	X: 1, 3, 4 & 8. Y: 5
X,Y	WO90/12945A1	(TEINTURIER-MILGRAM) - whole document relevant. Equivalent EP0422197 & US5092862	X: 1, 3, 4 & 8. Y: 5
X	US4040142A	(IPPOLITO) - whole document relevant, particularly column 3, lines 8-16.	1, 3-5 & 8.
X,Y	DE3704242A	(JESSURUN) - see figure 2.	X: 1, 2, 6 & 8. Y: 5
X,Y	DE3219492A	(HARNISCH) - see cover 11 with vertically-adjustable attachments 18,19 in channels 16,17.	X: 1, 2 & 6-8. Y: 5
X,Y	FR2572124A	(DENECE) - see figure 2.	X: 1, 2, 6 & 8. Y: 5

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

The Patent Office

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Application No: GB 9521468.0 **Examiner:** F J Rowlatt
Claims searched: 1-9 **Date of search:** 24 November 1995

Category	Identity of document and relevant passage		Relevant to claims
X,Y	FR2565622A	(USINES G WATTELEZ) - see especially cover 10 in figure 1 with vertically-adjustable attachments 11,12 in channels formed by rails 110 (figure 2).	X: 1, 2 & 6-8. Y: 5

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.